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**BEFORE THE BOARD OF PATENT APPEALS  
AND INTERFERENCES**

Application Number: 09/503,990

Filing Date: February 14, 2000

Appellant(s): SHERIF ET AL.

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SHERIEF et al.  
For Appellant

**EXAMINER'S ANSWER**

This is in response to the appeal brief filed 8/23/04.

**(1) *Real Party in Interest***

A statement identifying the real party in interest is contained in the brief.

**(2) *Related Appeals and Interferences***

A statement identifying the related appeals and interferences which will directly affect or be directly affected by or have a bearing on the decision in the pending appeal is contained in the brief.

**(3) *Status of Claims***

The statement of the status of the claims contained in the brief is correct.

**(4) *Status of Amendments After Final***

No amendment after final has been filed.

**(5) *Summary of Invention***

The summary of invention contained in the brief is correct.

**(7) *Grouping of Claims***

Appellant's brief includes a statement that claims (all) stand or fall together and provides reasons as set forth in 37 CFR 1.192(c)(7) and (c)(8).

**(8) *ClaimsAppealed***

The copy of the appealed claims contained in the Appendix to the brief is correct.

**(9) *Prior Art of Record***

US 5,903,862

Weaver et al.

05-1999

Haykin, Simon "Adaptive Filter Theory" , third edition, 1996, pages 5 and 9-21.

**(10) *Grounds of Rejection***

The following ground(s) of rejection are applicable to the appealed claims:

Claims 1-2, 9-11 and 15 are rejected under 35 U.S.C. 103 (a). This rejection is set forth in a prior Office Action, mailed on 2/16/04.

***Claim Rejections - 35 USC § 103***

I. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

II. Claims 1-2, 9-11 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Weaver, Jr. et al. (Weaver) (US 5,903,862) in view of Simon Haykin (Haykin), adaptive Filter Theory, third edition, 1996, pages 2-5 and 9-21.

**As per claim 1:** a method for communicating comprising the steps of:

receiving, a first encoded voice signal as a first set of voice signal parameters reads on '862 (see figs. 1, 2, 6 and 7; col. 3, lines 332-35).

directing, the first set of voice signal parameters to a first speech decoder to generate a voice signal reads on '862 (see figs. 1, 2, 6 and 7; col. 3, lines 42-46).

transmitting, the second set of voice signal parameters reads on '862 (see col. 4, lines 44-49). But, Weaver also discloses that one of the primary reasons that the tandem vocoders produce degraded quality audio signals is that modern vocoders use

postfilters at the output of the speech decoding process (see col. 8, lines 48-58) and suggests that, as an alternative approach, a filter in a decoder can be modified by making the frequency response of the filter more gentle (see col. 9, lines 3-7, lines 54-63). But, Weaver does not explicitly teach about feeding the voice signal from the first speech decoder to an adaptive filter to produce a modified voice signal, the adaptive filter being operative to modify the spectrum of the voice signal from the first speech decoder so as to substantially compensate for spectral distortion introduced by an encoding and decoding of the voice signal, as claimed by applicant. However, in a related field of endeavor, Haykin teaches that "The ability of an adaptive filter to operate satisfactorily in an unknown environment and track time variations of input statistics make the adaptive filter a powerful device for signal processing and control applications. Indeed, adaptive filters have been successfully applied in such diverse fields as communications, radar, sonar, seismology, and biomedical engineering. Furthermore, Haykin also states "an input vector and a desired response are used to compute an estimation error, which is in turn used to control the values of a set of adjustable filter coefficients (see page 18, lines 11-24). According to the teaching, an adaptive filter can be used in an "unknown environment" which can include the environment between vocoders of a transmitter and a receiver (tandem vocoders), for controlling an output signal using the input and a desired response to compute an estimated error by which values of the adaptive filter coefficients are adjusted. Therefore, it would have been obvious for one of ordinary skill in the art at the time the invention was made to replace Weaver's modified filter with Haykin's adaptive filter for the advantage of adaptively canceling noise and/or echo in a communication system (see page 21, table 1). Note: the specific location in a circuit, as to where to place an adaptive filter, is within the realm of a choice of design by one of skilled in the art.

**As per claim 2:** the method further comprising the steps of:

Modifying the spectrum of the voice signal from the first speech decoder using the adaptive filter which compensates for digital distortion which will occur when the encoded modified voice signal represented by the encoded set of voice signal parameters is decoded reads on '862 (see abstract; col. 2, lines 32-48). When modified as shown in the rejection of claim 1, the system would have an adaptive filter to compensate for signal lose caused by external or internal interference or/and noise.

**As per claim 9:** Claim 9 is rejected on the same ground and motivation as claim 1 since claim 9 is the apparatus claim that must carry out the method steps of claim 1.

**As per claim 10:** the wireless call connection wherein the adaptive filter modifies the magnitude of selective frequencies of the spectrum of the voice signal from the decoder reads on 'Haykin (see page 18, the sub-title, 7. Applications).

**As per claim 11:** the wireless call connection wherein the adaptive filter modifies the magnitude of selective frequencies of the spectrum of the voice signal from the decoder to compensate for digital distortion caused by encoding and decoding the modified voice signal reads on 'Haykin (see page 18, the sub-title, 7. Applications). According to the teaching, the input signal to the adaptive filter could be any digital signal transmitted in an environment that has noise or interference. Furthermore, it is obvious from the teaching that a magnitude of a signal is reduced by the amount of an estimated error.

**As per claim 15:** the wireless call connection wherein the adaptive filter increases the db of selective frequencies of the spectrum please refer to claim 1.

***Allowable Subject Matter***

III. Claims 3-8 and 12-14 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***(11) Response to Argument***

With regard to claims 1-2, 9-11 and 15, appellants establish their argument by generally saying, "the sole issue in this appeal is that of whether the cited references can properly be combined pursuant to § 103 in a manner to render Appellants' claimed invention patentably indistinct therefrom." (see, Brief, page 6). Specific arguments, by appellants, as to why the references are not combinable and corresponding responses, by examiner of record, are presented in the following manner.

**Argument I:** with regard to claims 1-2, 9-11 and 15, appellants argue that "Although the Weaver reference provides a general teaching in respect to tandem encoder/decoder operations, and is particularly directed to a method for detecting the occurrence of such tandem operations, it does not provide any teaching that could reasonably be constructed to show or suggest the introduction of an adaptive filter between the first decoder and the following encoder, as acknowledged by the Office Action."

**Response I:** examiner respectfully agrees that the Weaver reference teaches operations of tandem encoder/decoder in a wireless communication system wherein, one vocoding system is coupled to another vocoding system for encoding and decoding voice signals between a local transmitter and remote receiver. Examiner also agrees

that Weaver does not explicitly teach **an adaptive filter between the first decoder and the flowing encoder**, claimed and argued by appellants. However, examiner respectfully disagrees with appellants' argument that Weaver does not suggest for one of ordinary skill in the art to construct an adaptive filter into a tandem vocoder. First, Weaver teaches that each tandem vocoder is likely to have a post-filter or other filter which induces spectral distortion/degradation (see col. 9, lines 54-63). Second, Weaver also teaches that, "one method to prevent the degradation due to the use of post-filters is to modify the filter within the vocoders when two vocoders are operating in tandem." (see col. 8, lines 61-col. 9, line 7). This, advantageously, is done by incorporating within the system a technique for detecting the tandem vocoder operation so as to take an appropriate action, one of which is modifying the filter in the tandem vocoder. Since, adaptive filters are filters which can be dynamically modified, the examiner considers the filter modifying feature in Weaver as a suggestion for an artisan, skilled in tandem vocoder operation, to be prompted by the teaching of Haykin's adaptive filter theory and application (see below).

**Argument II:** regarding claims 1-2,9-11 and 15, appellants' further argue by saying "Haykin is simply an academic treatise directed to a teaching of adaptive filter principles generally – primarily an exploration of the mathematical principles underlying operations adaptive filters; with a limited discussion of the application of such filter." The argument is further expounded by asserting "plainly, nothing in the teaching of Haykin shows, or could reasonably be construed to suggest the use of an adaptive filter for making a spectral adjustment to the output of a decoder. Even more, there is certainly no

teaching in Haykin which might suggest the application of such an adaptive filter to effect a spectral correction in a tandem encoder/decoder arrangement."

**Response II:** examiner agrees that Haykin does not directly/explicitly suggest the use of an adaptive filter in a tandem vocoder for making spectral adjustment. But, first, one of ordinary skill, in the art of filters, knows that filters make spectral adjustments in communication channels. Second the word "adaptive" is a suggestion for modification or even more, a self modifying entity or device based on some detection of events in a system. Furthermore, Haykin teaches the applicability of adaptive filters by saying "Indeed, adaptive filters have been successfully applied in such diverse fields as communications, radar, sonar, seismology, and biomedical engineering. Although these applications are indeed quite different in nature, nevertheless, they have one basic common feature: an input vector and a desired response are used to compute an estimation error, which is in turn used to control the values of a set of adjustable filter coefficients." (see Haykin, page 18). Even more, suggestive of Haykin about the use of an adaptive filter in communication systems is that "the ability of an adaptive filter to operate satisfactorily in an unknown environment and track time variations of input statistics make the adaptive filter a powerful device for signal processing and control applications." Hence, one of ordinary skill person reading Haykins adaptive filter theory and application, can readily recognize the usefulness of Haykin's adaptive filter for controlling the values of adjustable filter coefficients in Weaver's tandem vocoder, so as to improving the voice signal transmission/reception in through "unknown environment", between a transmitter and a receiver.

**Argument III:** appellants further argue that, since neither Weaver nor Haykin provides motivation/teaching for combining the two references, as provided in the Office Action, the combination could only occur through the prohibited use of the 'hindsight' provided by applicant's disclosure.

**Response III:** examiner respectfully disagrees with the argument. As shown in the above arguments/response discussions, the two references, besides being in a related field of endeavor, provide a person of ordinary skill with ample teaching/motivation for combining the references as shown in the rejection of the claims.

For the above reasons, it is believed that the rejections should be sustained.

Respectfully submitted,

Meless Zewdu  
September 29, 2004

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